Frequencies VHF,UHF,and SHF Newsletter NZ

This newsletter is compiled by Kevin Murphy ZL1UJG to promote operational and construction activity on the VHF, UHF and SHF Amateur Radio allocations in New Zealand.

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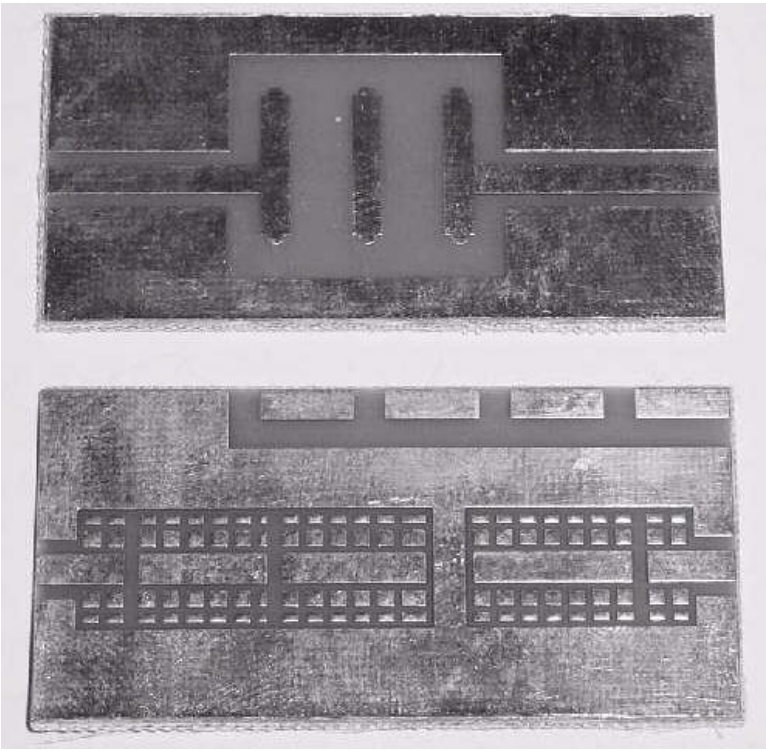
Issue 1 28 August 2001

The following article is from the latest Issue of the Waikato VHF Group Newsletter (The World Below 400 GHz)

New PCB's

The Waikato VHF Group has some new filter and amplifier PCB's.

Both are double sided pcbs. The top pcb is the new filter. With the addition of tuning capacitors this is primarily used as a 1296 MHz filter. adding fixed capacitors across the tuning capacitors for lower frequencies. It can also be used as a selective amplifier/ frequency multiplier by adding a mmic amplifier such as a MAR-8. Another use is a pin diode switch by combining the two pin diodes at the centre stripline.



When used in this configuration then a MMIC amplifier can be also fitted on the PCB as in the 1st TX stage of a transverter.

The second PCB is primarily an amplifier pcb with little tuning pads which make it easier to add tuning at high frequencies.

At lower frequencies coils and trimmer capacitors are added for tuning.

New PCB's cont'd

We can supply premade pcbs in amplifier/multiplier or pin diode switch in the filter pcbs.

For the amplifier pcb we have prototyped power amplifiers with greater than 1 watt output and 16db gain for a single device at 1296 MHz and for two stage amplifiers 28 dB gain.(with a faulty device)

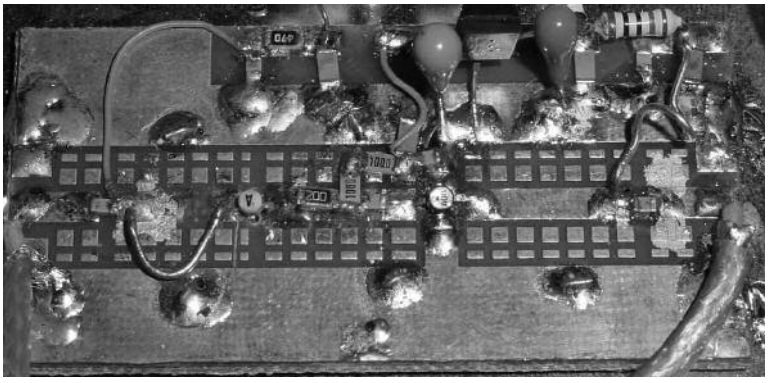
At 2424 MHz we have also prototyped poweramplifiers with 11 dB gain and +29 dBm (800 mW) and for two stage amplifiers have given us 27 dB gain

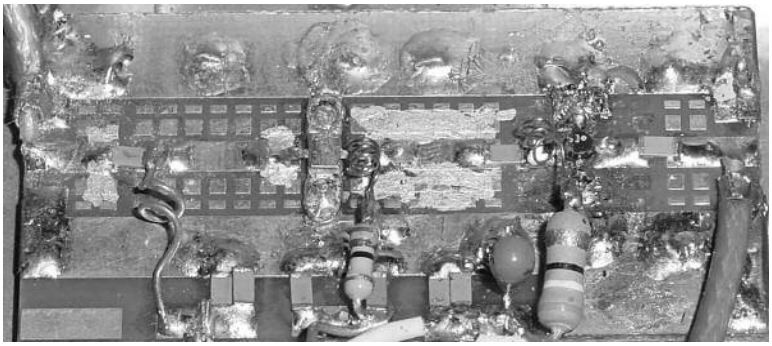
Using the same pcb we have made prototype 5-10 watt amplifiers for 2424 MHz using Mitsubishi Gasfet devices

A MMIC amplifier is used for the driver and a power GaAsfet for the output stage. They do require a sequenced power supply! They make excellent ATV amplifiers as well as as for output stages of transverters and transmitters/ beacons. This is a lower cost alternative for the Mitsubishi M67715 1296 MHz driver module and provides good results also at 2424 MHz

We have also prototyped two stage low noise amplifiers (using a gasfet and MMIC) for 2424 MHz giving about 23 dB gain.

For 1296 MHz we recommend using an additional interstage filter due to the frequency proximity of Cellular / radar/ seti/ TV





The top picture is a prototype 2424 2 stage preamp and the lower picture is a 2 stage 2424 MHz power amplifier.

Using these pcbs QSO's to 65 km acheived at 700 mW TX output using a 820 gm fruit can as the antenna on 2424 MHz

Contact Tom Bevan or Kevin Murphy if interested in either blank pcb's, circuit information or finished units.

The pcbs are $3.50 each or 3 for $10. Available now!

The above mentioned pcb's will be available at the Hamilton Amateur Radio Club Market Day on Saturday September 8th 2001 at Claudelands Showgrounds. Buyers 10 am

END OF ARTICLE

Ray ZL2TAL now has a 1 watt 2424 MHz transverter courtesy of Tom ZL1THG and myself. A second transverter is being constructed as a loaner to a station on the Mainland.

The picture to the left is of my home brew 2424 Transverter. On the left is a G4DDK004 oscillator and muliplier. The grey box houses the crystal oscillator and above that is the DC switching circuitry using fets. Above that is the mixer and IF attenuator.The middle grey unit is a multiple section 2424

The unit below the filter is a rf switch and two stages of amplification.

(That particular circuit is a bit of a rats nest).To the right of the filter is the RF stage (23 dB gain using NE72084 and MAR8) The brown unit on the right is another TX filter and above that is the TX amplifier using ERA5 and RF Power FET.

The TX/RX relay is external and allows the addition of preamp and power amp. The RX noise figure is 2.5 dB and gain is 8.5 dB. The Final TX amplifier is attached to a small copper sheet using veropins for the final device and wires holding the board.While aligning the prototype I ran the device just with the copper sheet on the bench at 500mA at 8v (4 watts) and the copper got mighty hot but no device failure occurred. so when the unit is screwed down to a diecast box this will be sufficient. (Gain is 27 dB and output power is +29 dBm (800 mW) at 1 dB compression.

Much time was spent on the prototype amplifier units finding the optimum tuning points and using conductive paint to trim. Some small work is needed to the IF attenuator and Final amplifierIn the next issue some circuit information will be

MAR and ERA devices are manufactured by MiniCircuits Limited.
NE72084 Gasfet is manufactured by NEC

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Details
Age 43 yrs. Married(Almost 1year)
Held Amateur licenses since 1977
Interested in RF circuit design.
Working on being active on VHF, UHF and SHF bands

Work History 1974-
Royal New Zealand Dockyard(radio section) 18 months
Racal Radio in UK for 10 years as Instrument Calibration Engineer and Post Development Services Engineer
Telecom Repair Services
Now currently working for Repair Group Limited
Repairing Microwave radio systems

Newsletter is produced on Acer 390 Laptop 48 MB of Ram with Microsoft Home Publisher 2000 and Jaws PDF Creator. Digital Photographic Images produced by Sony DSC-S70 Cybershot Digital Camera (still images)